

Statement of James P. Shine, Ph.D., Harvard School of Public Health

April 8, 2013

To: Metropolitan Beaches Commission

My name is James Shine. I have a Doctoral Degree in Marine Sciences, and have been working on marine pollution issues in Boston for over 25 years. I serve as a member of the Outfall Monitoring Science Advisory Panel, a group of scientists invited by the Commonwealth and the USEPA to oversee scientific issues associated the MWRA's discharge of sewage into Massachusetts Bay. I am currently faculty at the Harvard School of Public Health, where I direct the Exposure, Epidemiology, and Risk Program within the Department of Environmental Health. I also serve on the Commonwealth's Charles River Water Quality Commission, where we face similar beach water quality issues.

We rely on clean waters for many reasons. An important use is for recreation. Our Commonwealth has many fine beaches that are heavily used. Indeed, one strong motivation for the clean-up of Boston Harbor was to make its beaches swimmable once again. It is important, therefore, that adequate strategies are in place to protect the health of people who swim at these beaches.

Monitoring of beach water quality is a valuable activity. Given sufficient measurements, it allows us to understand the overall 'quality' of a beach. An overall grade for the beach, so to speak. Beach monitoring at the Commonwealth's beaches, for the most part, is done very well. Routine beach monitoring, however, is a different activity relative to day-to-day management, such as determining whether the water is safe to swim in on a given day.

The test for the indicator bacteria that determines the safety of the water takes 24 hours. The determination of whether a beach is safe or not on a given day is based, therefore, on the previous day's results. If the conditions on one day are often similar to conditions on the next day, this would be fine. The problem is that there is very little relationship between one day's conditions and the next day's conditions. Basing the flagging of a beach on yesterday's results would not often be accurate.

In a study I co-authored on alternative methods to manage beaches, we examined 5 years of data for 5 beaches in Boston Harbor. The data indicated that when the water was unsafe for swimming, there was a red flag present only 25% of the time, meaning that 75% of all the days when people should not have been swimming there was a blue flag allowing them to swim. This isn't good. Similarly, when a red flag was present, it was correct only 22% of the time, meaning that 78% of the time a red flag was present, people were prevented from swimming in clean water. This is not optimal beach management.

Monitoring of beach water quality and posting the data at a beach in a timely fashion is clearly important, and must continue. However, more creative strategies to manage beaches on a day-to-day basis with respect to water quality are needed. The monitoring data is clearly a tool to develop flagging strategies specific for a specific beach. Ongoing monitoring will demonstrate how effective those strategies are, allow for adjustments, or indicate that new strategies must be developed altogether.

